

SOS in Computer Science and Applications, Jiwaji University

Course : MCA Fourth Semester
MCA403 : JAVA PROGRAMMING
Topic: Multithreading in Java
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Multithreading in Java :

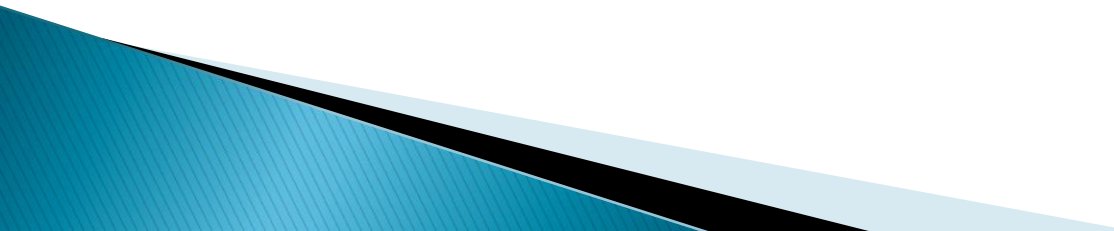
- ▶ Multithreading in java is a process of executing multiple threads simultaneously. The aim of multithreading is to achieve the concurrent execution.

Thread

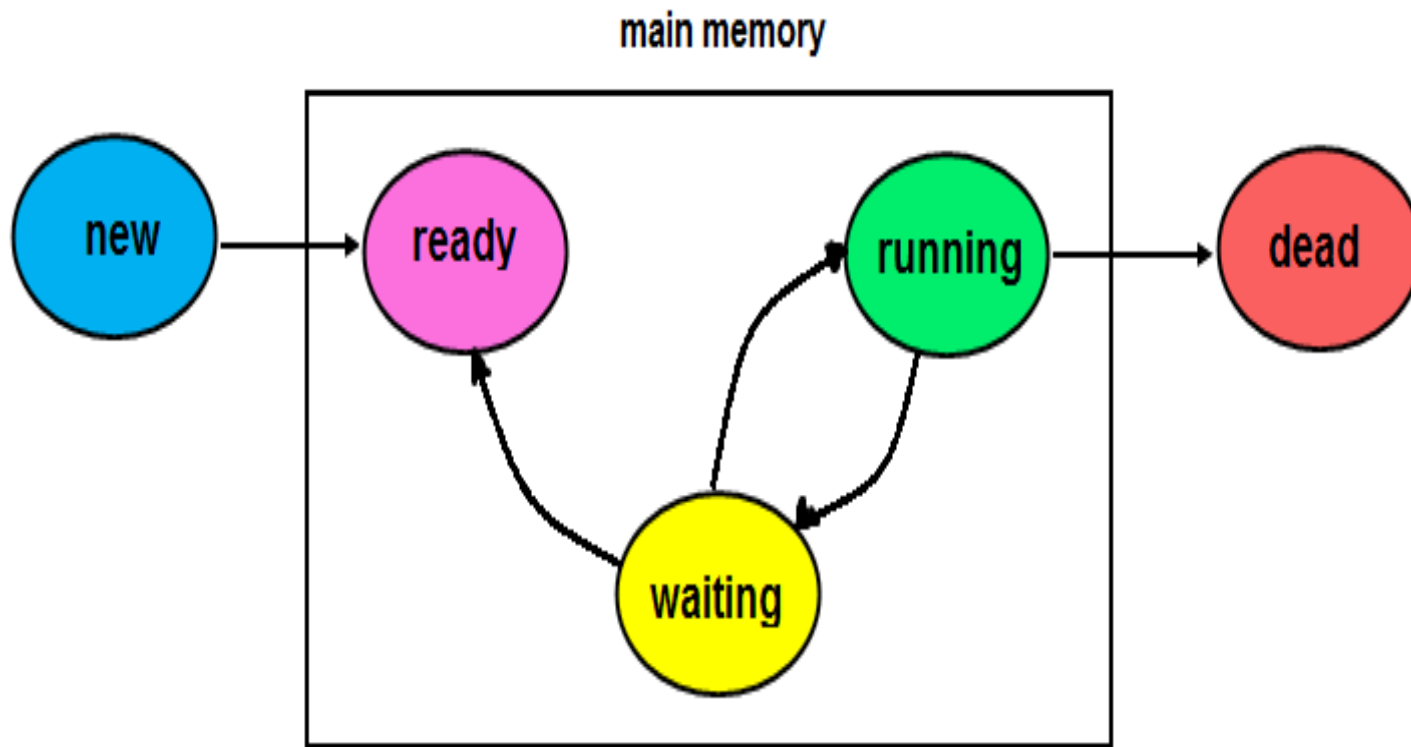
- ▶ Thread is a lightweight components and it is a flow of control. In other words a flow of control is known as thread.

State or Life cycle of thread

State of a thread are classified into five types they are :

- ▶ New State
 - ▶ Ready State
 - ▶ Running State
 - ▶ Waiting State
 - ▶ Halted or dead State
- 

State or Life cycle of thread



Using thread class :

In java language multithreading program can be created by following below rules :

1. Create any user defined class and make that one as a derived class of thread class.

```
class Class_Name extends Thread
{
    .....
}
```

2. Override run() method of Thread class (It contains the logic of perform any operation).

3. Create an object for user-defined thread class and attached that object to predefined thread class object.

```
Class_Name obj = new Class_Name ;
Thread t=new Thread(obj);
```

4. Call start() method of thread class to execute run() method.
5. Save the program with filename.java.

```
class Class_Name extends Thread  
{
```

```
public void run()           Tutorial4us.com  
{  
.....  
.....  
}  
.....  
.....  
}
```

```
Class_Name obj = new Class_Name();
```

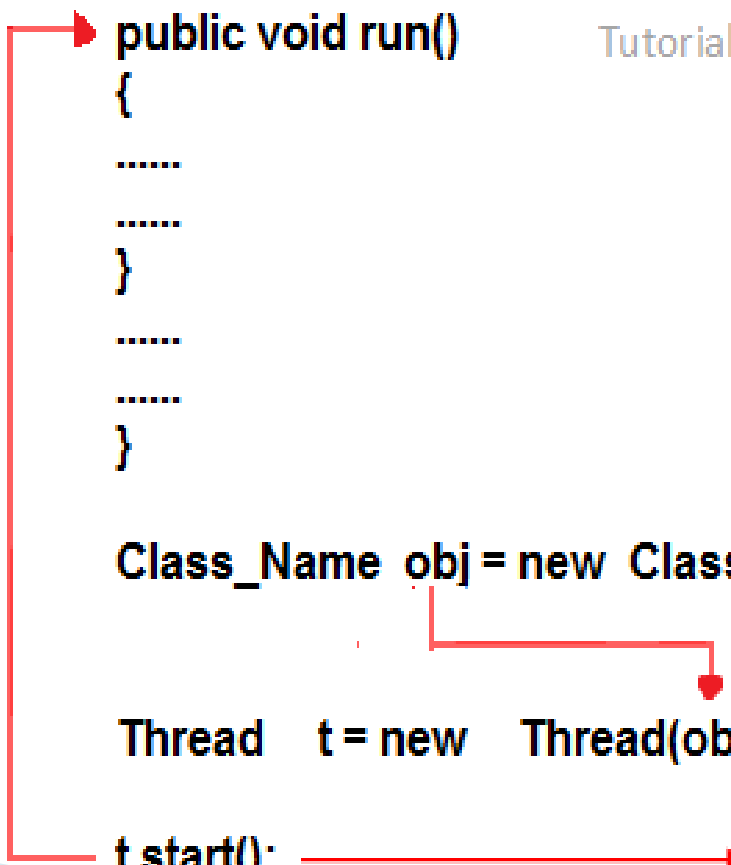
```
Thread t = new Thread(obj);
```

```
t.start();
```

Ready State

Running State

Execute run()



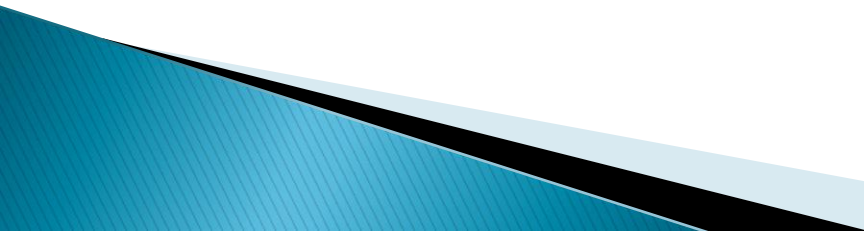
Methods of Thread class :

- ▶ `getPriority()`
- ▶ `setPriority()`
- ▶ `getName()`
- ▶ `setName()`
- ▶ `isDeamon()`
- ▶ `run()`
- ▶ `start()`
- ▶ `sleep()`
- ▶ `suspend()`
- ▶ `resume()`
- ▶ `stop()`
- ▶ `isAlive()`
- ▶ `currentThread()`
- ▶ `join()`
- ▶ `getState()`
- ▶ `yield()`

Using Runnable Interface :

- ▶ Runnable is one of the predefined interface in java.lang package, which is containing only one method and whose prototype is " Public abstract void run " .
- ▶ The run() method of thread class defined with null body and run() method of Runnable interface belongs to abstract. Industry is highly recommended to override abstract run() method of Runnable interface but not recommended to override null body run() method of thread class.

Rules to create the thread using Runnable interface :

- ▶ Create any user defined class and implements runnable interface within that
 - ▶ Override run() method within the user defined class.
 - ▶ call start() method to execute run() method of thread class
 - ▶ Save the program with classname.java
- 

Example :

- ▶ **class Class_Name implement Runnable**
 {
 public void run()
 { }
 }
- ▶ **Class_Name obj=new Class_name();**
 Thread t=new Thread();
 t.start();